



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : D. Amnon Silverstein

Art Unit : 2612

Serial No. : 09/484,667

Examiner : Rosendale, Matthew L.

Filed : Jan. 18, 2000

Title : POINTING DEVICE FOR DIGITAL CAMERA DISPLAY

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

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Technology Center 2600

DECLARATION UNDER 37 CFR § 1.131

I, D. Amnon Silverstein, hereby declare as follows.

1. I am the sole inventor of the subject matter recited in the pending claims of the above-identified patent application, as amended by the Amendment filed January 13, 2004.

2. Prior to December 23, 1998, I conceived the idea of a camera that included a display and was configured to present images on the display in accordance with sensed motion of the camera.

3. Prior to December 23, 1998, I prepared the Invention Disclosure document that is attached hereto as Exhibit A and contains a description of multiple implementations of the idea of ¶ 2.

a. Page 1 of Exhibit A includes a DATE RCVD field with a date prior to December 23, 1998.

b. Page 2 of Exhibit A includes a Signature of Witness(es) field signed and dated by Russell Iimura and Xuemei Zhang prior to December 23, 1998.

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to:  
Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on:

June 14, 2004

Date

(Signature of person mailing papers)

Edouard Garcia

(Typed or printed name of person mailing papers)

- c. I signed and dated each of pages 1 and 3-8 of Exhibit A prior to December 23, 1998.
- d. Each of pages 3-8 of Exhibit A also was signed and dated by Russell Iimura and Xuemei Zhang prior to December 23, 1998.
- e. Each of the dates deleted from Exhibit A is prior to December 23, 1998.

4. Prior to December 23, 1998, I began working on an implementation of the idea of ¶ 2. Various features of this implementation are described in a set of slides that are dated October 26, 1998, and are attached hereto as Exhibit B. These slides were presented during a confidential meeting internal to Hewlett-Packard Company on October 26, 1998.

5. Between the date that the Invention Disclosure document of Exhibit A was prepared and December 23, 1998, I was working on a motion detector and a display that would be incorporated into an implementation of the idea of ¶ 2. After December 23, 1998, I continued to work on the motion detector and the display, as evidenced by the following:

- a. The January 1999 Monthly Reports document attached hereto as Exhibit C describes work performed on improving optical motion tracking aspects of the motion detector (see the paragraph following the heading "CAST"). This document also describes work performed on improving aspects of the display relating to field-sequential color flicker (see the paragraph following the heading "Display Image Quality"). The portions of Exhibit C that are not mentioned in this Declaration have been deleted.
- b. The February 1999 Monthly Reports document attached hereto as Exhibit D describes work performed on improving motion estimation aspects of the motion detector (see the paragraph following the heading "CAST"). This document also describes work performed on improving aspects of the display relating to field-sequential color flicker (see the paragraph following the heading "Display Image

Quality"). The portions of Exhibit D that are not mentioned in this Declaration have been deleted.

- c. The March 1999 Monthly Reports document attached hereto as Exhibit E describes work performed on improving motion tracking aspects of the motion detector, as well as updates made to the software framework (see the paragraph following the heading "CAST"). This document also describes work performed on improving image quality aspects of the display, as well as the hiring of a contractor to build a testbed for the display (see the paragraph following the heading "Display Image Quality"). In addition, this document reports that the basic display hardware had been completed (see the paragraph following the heading "Display Image Quality"). The portions of Exhibit E that are not mentioned in this Declaration have been deleted.
- d. The April 1999 Monthly Reports document attached hereto as Exhibit F describes work performed on improving motion tracking aspects and image frame stitching aspects of the motion detector (see the paragraph following the heading "CAST"). This document also reports that new motion tracking software was installed in a prototype of an implementation of the idea of ¶ 2 (see the paragraph following the heading "Display Image Quality"). The portions of Exhibit F that are not mentioned in this Declaration have been deleted.
- e. The May 1999 Monthly Reports document attached hereto as Exhibit G describes work performed on improving motion tracking aspects of the motion detector, as well as updates made to the display processing functions and the lens distortion correction functions of the software framework (see the paragraph following the heading "CAST"). This document also reports that two Berkeley students had been selected to work on aspects of the user interface for an implementation of the idea of ¶ 2 (see the paragraph following the heading "Display Image Quality"). The portions of Exhibit G that are not mentioned in this Declaration have been deleted.

f. The June 1999 Monthly Reports document attached hereto as Exhibit H reports that a first prototype of an implementation of the idea of ¶ 2 had been completed (see the paragraph following the heading "Microdisplay viewfinder testbed (Capybara)"). The portions of Exhibit H that are not mentioned in this Declaration have been deleted.

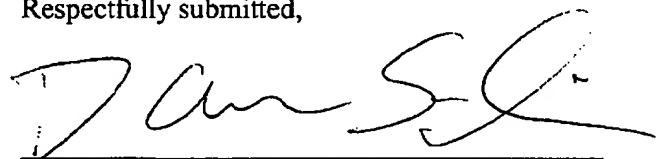
6. After working on various components of an implementation of the idea of ¶ 2, including the motion detector and the display of ¶ 5, a working prototype of the idea of ¶ 2 was completed in June 1999, as evidenced by Exhibit H and the marked section of page 1 of an e-mail dated June 30, 1999. This e-mail was sent by me to [farrell@hpl.hp.com](mailto:farrell@hpl.hp.com) and is attached hereto as Exhibit I.

7. A second working prototype of the idea of ¶ 2 was completed in August 1999. The features of the second prototype are described in a set of slides attached hereto as Exhibit J. These slides were presented during a confidential meeting internal to Hewlett-Packard Company on November 1, 1999.

8. I declare that all statements made herein of my own knowledge are true and that all statements made on declaration and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Respectfully submitted,

Date: June 10, 2004

  
D. Amnon Silverstein

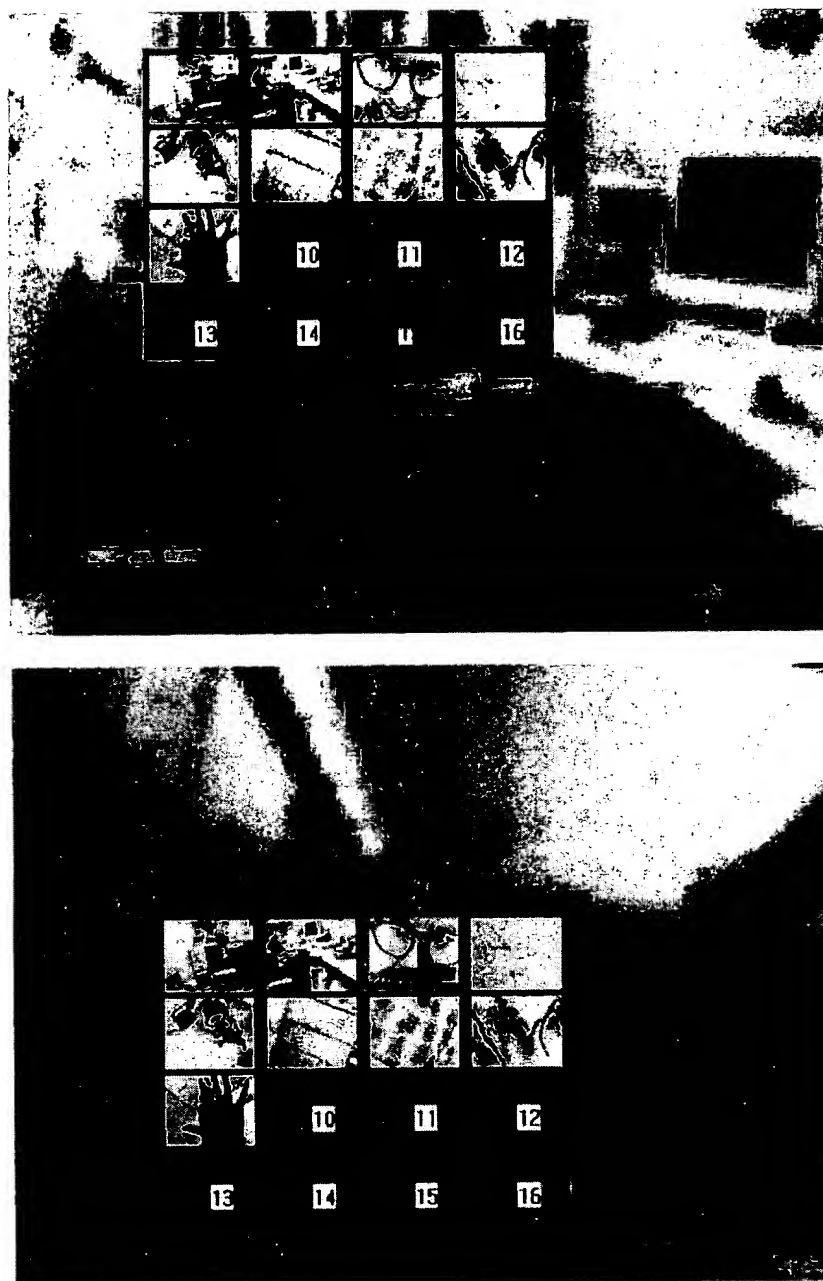


Figure 1. Using the camera like a mouse.

A sheet of thumbnail images is shown superimposed on a view through the camera (upper figure). The cross is a cursor, and this cursor is always fixed relative to the camera. With motion tracking, the sheet of thumbnail images is fixed relative to the world. That is, the computer constantly repositions the sheet as the camera moves, so the sheet seems to be fixed in position relative to the objects seen through the camera. When the user moves the camera (lower figure), the cursor moves relative to the world and to the world-fixed thumbnails. This allows the user to select an image by simply pointing the camera at the desired image. The camera itself is used as the only pointing device. No other mouse, joystick or other device was used to move the cursor in this figure. The software used is in the attached listing.

*Dan S. K.*  
[Redacted]

*6/1/84*  
[Redacted]

*Russell M. P.*  
[Redacted]

6/23

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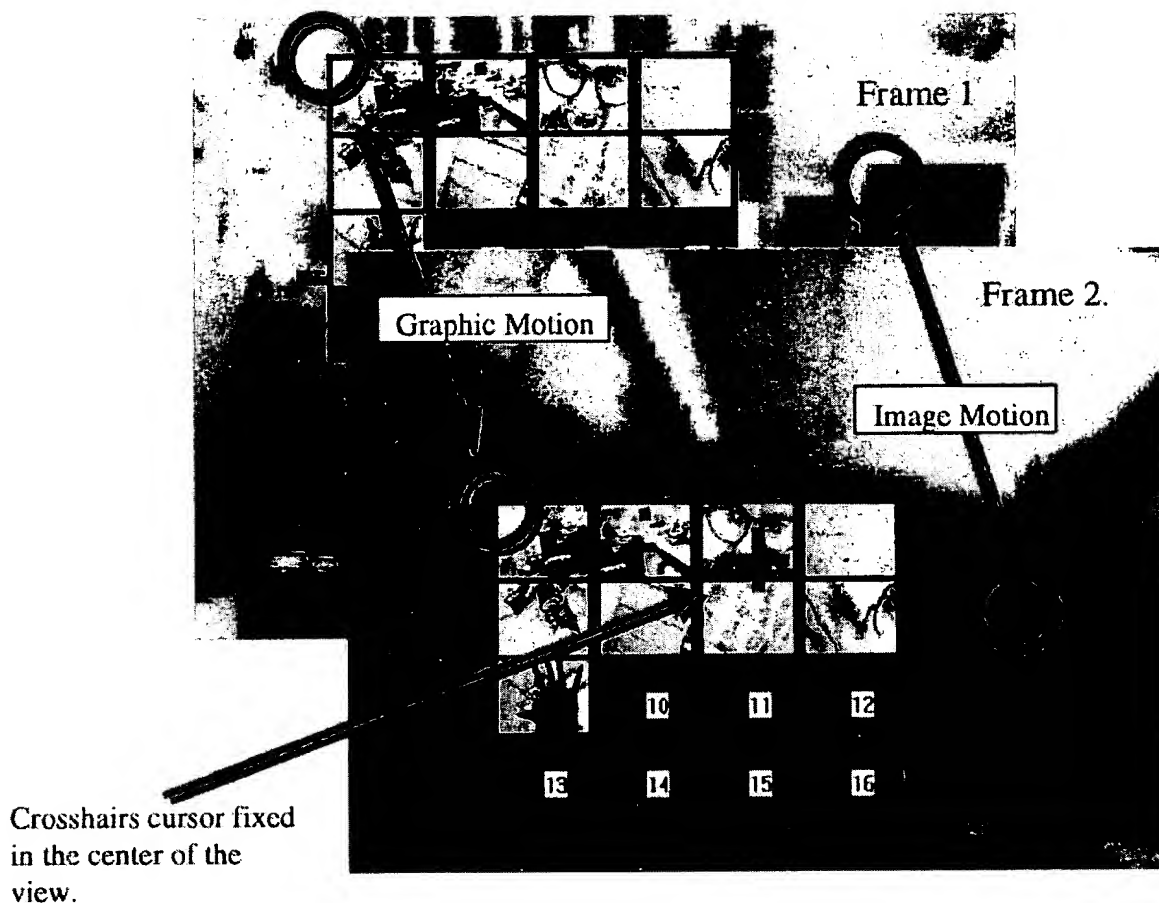


Figure 2. How it works

Motion tracking software (developed by Andrew Patti et. al.), tracks the motion of image features in the scene. For example, the image of the computer monitor on the desk moved down and slightly right between frame 1 and frame 2. The sheet of thumbnails is moved by the same amount and in the same direction as the features in the scene. The sheet thus appears to be motionless relative to the objects in the scene (such as the computer monitor).

Since the thumbnails appear fixed relative to the world, the user can use the camera like a gun-sight. The crosshairs stay fixed relative to the camera, and the sheet of thumbnails stays fixed relative to the world, so the user can place the crosshairs on the desired thumbnail by simply aiming the camera.

*Dan S. Liddy*

*Phyllis*

8/23

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